Towards the new world with Croquet Project

Web-Oriented Software Development Seminar

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Content

- What is Croquet, background and motivation
- Demo of the system
- Technologies
- Evaluation

Croquet in this seminar

- Not web-oriented programming as it is presented so far
  - Not a language, framework or tool for web application programming
  - Not even for web
- The target is to overcome the limitations of current web
- A system, an architecture, an operating system
- New metaphor, new way of using computer

Background and motivation

- Started from frustration with the current state of the operating systems at the time (somewhere around 1990, the situation hasn't been changed much though)
- "If we were to create a new operating system and user interface knowing what we know today, how far could we go?"
- Away from the document and desktop metaphor
  - That has been unchanged from Xerox and Mac times
- Sharing information in the context of the social interactions
  - Creating a place where people can truly interact

- Make something better than Web

“If we would have known what we know today” Assumptions

- HW is fast
- 3D graphics is really fast and is getting faster
- Late bound languages have experienced a renaissance in both functionality and performance. Code, i.e. behavior, should also be just another media
- Communication is essential part of the computing systems, but communication between people is still mostly done via email/instant messages. Computer environment should be a real meeting place.
- Runtimes are cool

Web today

- Problems
  - Document oriented/publishing oriented
  - Stateless interactions
  - Generic client
  - Where are people
- Current web has failed in
  - Net-generation
  - Peer-to-peer
  - ad-hoc collaboration
  - engagement

Croquet: New kind of System

- System architecture that overcomes limitations of web. Focus on deep collaboration between teams of users.
- Consist of shared virtual spaces where people can see each others actions and can collaborate. All objects are shared
- Single medium for all collaboration
- 3D world
- It mirrors the current incarnation of WWW in many ways, but now people can visit and work inside the world in net: Real ad-hoc collaboration.
- “The thing is not in the code but in the UI”
- No distinction between the user environment and the development environment
- From desktop metaphor to
  - Office metaphor, classroom metaphor, laboratory metaphor, campus metaphor

History

- Story started basically 15-20 years ago, from the ideas of 6 current chief architects
  - Alan Kay, David A. Smith, David P. Reed, Andreas Raab, Julian Lombardi, Mark P. McCahill
- Alan Kay was sort of founder of the people and ideas
- David A. Smith initiated the Croquet project with a conversation he had with Alan in 1990, where they both expressed their frustration with the current state of operating systems at the time.
- 1994 two user collaborative system, built by Smith.
- 1999 OpenSpace, an early Croquet (Smith again)
- Kay and Smith with Raab and Reed started making Croquet itself 2001. First working code 2002
- Julian Lombardi and Mark McCahill joined 2003

Current Status

- Croquet SDK 1.0 Beta was released 18.4.2006
- Release for Windows, Linux and Mac OS
- Open Source, licensed with very free license
- No patents
- Croquet trademark is owned by Viewpoints Research Institute, nonprofit research organization

Demo

- By McCahill

Croquet Technology

- Non-application based, replication/distribution of computing
- Fundamental building block of the Croquet architecture is system that makes every single object in the system collaborative
- Based upon the concept of replicated versioned objects coordinated by a universal timebase embedded in the communication protocol
- Peer-to-peer architecture
- Runtime based (Squeak)
- 3D rendering engine

Technologies: Squeak

- Squeak is a modern, open source, portable, optimized and full-features implementation of Smalltalk language and environment
- Croquet is based on Squeak framework
- Croquet brings the possibility to make Smalltalk type of dynamic changes to running system over net

- Croquet includes also its own scripting language. This is intended to be used for virtually all high level control and interactions.
- Multilanguage support in plans

Technologies: TeaTime

- Communication system
- Peer-to-peer
- Basis for object-object communication and world/object synchronization
- Basically after initial content synchronization only inputs/outputs are distributed
- Universal time base: input and output events are synchronized with global universal time, which is coordinated among all sites
- Temporal evaluation of objects

Technologies: TeaPot

- The graphics engine
- Based ultimately to OpenGL
- Based on the ideas of a retained graphical engine pipeline, although developers are provided also with direct OpenGL
- Physics engine

Some Technical Capabilities

- VoIP built in
- Sharing of video
- Sharing of sound
- Currently 10 concurrent users in the same virtual space, in the future even unlimited
- No security at the moment (in plans: private places, invitations)

Evaluation: is this the future

- IMHO: Interesting
- Used already
- Education is one of the main interests
- Extreme programming in level 2
- Changes in the ways of social interactions are needed also

References

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